Air Quality in Virginia

The Clean Air Act and Virginia

The Clean Air Act is the law that defines the U.S. Environmental Protection Agency's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The Clean Air Act requires EPA to establish national ambient air quality standards for pollutants such as sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, lead and particulate matter to protect human health. The act also requires new and modified major sources of air pollution to obtain permits and install air pollution control technology known as best available control technology, as needed to ensure that their emissions do not cause or significantly contribute to an exceedance of the air quality standards.

Under the Clean Air Act, states are responsible for ensuring that the national ambient air quality standards are achieved within each state's borders through development and implementation of state implementation plans. These plans contain requirements that limit the emission of air pollutants coming from sources like chemical plants, utilities and steel mills.

On behalf of the State Air Pollution Control Board, the Virginia Department of Environmental Quality's Division of Air Quality is responsible for developing Virginia's state implementation plan and meeting the Commonwealth's federal obligations under the Clean Air Act. The Division of Air Quality ensures the safety and quality of the air in Virginia by:

- Monitoring and analyzing air quality data through its statewide monitoring network
- Regulating sources of air pollution
- Developing plans with local, state and federal agencies to protect and improve Virginia's air quality
- Ensuring sources comply with those air quality requirements

Since the 1990s, air quality in Virginia has been improving steadily. For example, air emissions of nitrogen oxides, sulfur dioxide and volatile organic compounds have decreased due to federal and state air quality programs. This decrease is expected to continue.

Evaluating "grandfathered" facilities

When the Clean Air Act was enacted, it did not immediately affect many of the larger facilities then operating in Virginia because only new and modified sources are required to install best available control technology for air pollution. To this day, numerous large facilities in Virginia have not installed the pollution control technology because they have not been modified since the passage of the Clean Air Act. These facilities are considered to be "grandfathered" under the act.

In 2009, DEQ will begin evaluations of these older facilities to determine whether their emissions cause or contribute to exceedances of air quality standards. The 15 largest emitters of air pollution in Virginia will be evaluated over the next five years. The sources were selected for evaluation based on several criteria, including the amount of pollutants emitted from each plant and the number of Virginians potentially affected by air quality near each plant.

Air quality in Virginia has been improving steadily since the 1990s. Photo/DEQ

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These facilities will be evaluated with respect to their localized impact on at least the following three national ambient air quality standards:

- Sulfur dioxide (SO_2)
- Nitrogen dioxide (NO_2)
- Particulate matter less than 10 microns in diameter (PM-10)

Sulfur dioxide is a naturally occurring gas made of sulfur and oxygen that causes acid rain. Sulfur dioxide is released into the atmosphere when fossil fuels such as coal and oil are burned during metal smelting or other industrial processes. Major sources include power plants, industrial boilers, petroleum refineries, smelters, iron and steel mills.

Nitrogen dioxide is a highly reactive gas made of nitrogen and oxygen. Major sources include electrical utilities and industries where fuel is burned at high temperatures, as in a combustion process. Nitrogen dioxide is one of the main ingredients of ground-level ozone, which can trigger serious respiratory problems.

Particulate matter includes tiny solid particles or liquid droplets suspended in the air. Many man-made and natural sources emit this matter directly or emit other pollutants that react in the atmosphere to form it. These solid and liquid particles vary widely in size. Particles less than 10 micrometers in diameter pose a health concern because they can be inhaled into and accumulate in the respiratory system. Major sources of particulate emissions include coal-fired electric utility generators and other large combustion sources.

Evaluation of the impact of a facility's emissions on air quality is extremely complex and must be conducted on a case-by-case basis. A single industrial facility can have more than one grandfathered pollutant source, and there are about 300 such sources in Virginia, including coal-fired power plants, paper mills and chemical plants. Evaluations usually involve the collection of local meteorological data, air dispersion modeling, and site-specific air quality monitoring. While the facilities will comprise a starting point for a larger systematic assessment, the selection of these facilities for evaluation does not indicate they are not in compliance with air quality standards. If, on the basis of these evaluations, DEQ finds that air quality standards are exceeded, it will work with each facility to reduce pollution and ensure that the national ambient air quality standards for the appropriate pollutants are met.

Helpful links

Clean Air Act: www.epa.gov/air/caa

National ambient air quality standards: www.epa.gov/ttn/naaqs

Department of Environmental Quality, Division of Air Quality: www.deq.virginia.gov/air

Virginia state implementation plan: www.deq.virginia.gov/air/planning/sips.html